

IS6402P: BUSINESS DATA ANALYTICS WITH ARTIFICIAL INTELLIGENCE

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Business Data Analytics with Artificial Intelligence

Subject Code

IS - Information Systems

Course Number

6402P

Academic Unit

Information Systems (IS)

College/School

College of Business (CB)

Course Duration

Non-standard Duration

Other Course Duration

Intensive mode: 3 days

Credit Units

1.5

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

Other Languages

Other Languages for Medium of Instruction

Putonghua supplemented by English

Medium of Assessment

Chinese

Prerequisites

Basic knowledge of statistics

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details**Abstract**

The course mainly focuses on the introduction to theories, implementation, and tools of intelligence algorithms, the analysis of business cases, performance evaluation of different models.

The course aims to enable students to understand how to achieve business intelligence from theory to practice. The course cultivates students to master practical abilities, such as collecting data, preprocessing and analyzing data with Artificial Intelligence and other tools, solving data analysis questions, in order to assist companies' decision making and management, and improve its effectiveness. On completion of the course, students should be able to:

- (a) understand the basic concepts of business data analytics and intelligence;
- (b) master the theoretical knowledge of general intelligent models and their evaluation, implementation process, and tools;
- (c) understand how to choose an appropriate model to analyze specific business cases;
- (d) know how to implement business analytical models with support of Artificial Intelligence.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the basic concepts of data analytics and business intelligence.	25	x		
2	Identify the theories of general intelligent models, including supervised learning (e.g., regression analysis and decision tree) and unsupervised learning (e.g., clustering and association analysis), and their evaluation methods.	30	x	x	
3	Describe the specific implementation process with support of Artificial Intelligence and corresponding tools.	25	x	x	
4	Describe the operation and analysis of a specific business case, and effectively demonstrate the analytical results in oral, written and electronic formats.	20	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will be introduced to the concepts of business intelligence, the theories, evaluation, operation process, and corresponding tools of intelligent models. Students will also learn to accurately express business questions and data mining tasks, and apply intelligent models to solve specific business cases.	1, 2, 3	
2	Case Presentation	Students will present the implementation steps, analysis process, and application of tools (e.g., LLM and chatbots).	1, 2, 3, 4	
3	Case Study	Students will conduct case study in groups to investigate a real business case, including the choice of business question, data collection, achievement and evaluation of intelligent models, and analysis of results with support of Artificial Intelligence.	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks	Allow Use of GenAI?
1	Class Performance Degree of involvement in class discussions. The main forms include: (1) apply the concepts learned from the class in the class discussions; (2) apply the knowledge learned from extracurricular reading activities in the class discussions; (3) propose questions that can be discussed in class; (4) share personal experiences related to the discussed topics.	1, 2, 3, 4	40	-	Yes

2	Group Project A group project, which includes a written report or an oral presentation (if necessary), will be assigned to students to investigate a practical business case chosen from given cases in class or other cases that interest the students. The project includes the exploration of business question and data mining tasks of a business case, the implementation of intelligent model(s) and the analysis of model results through applying the learned knowledge.	1, 2, 3, 4	60	-	Yes
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Continuous Assessment (%)

100

Additional Information for ATs

Students must pass BOTH Class Performance and Group Project in order to get an overall pass in this course

Assessment Rubrics (AR)**Assessment Task**

Class Performance (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to show enthusiasm in discussing class questions and raising critical opinions.

Excellent

(A+, A, A-) Demonstrate strong enthusiasm in discussing class questions and raising critical opinions.

Good

(B+, B, B-) Demonstrate good enthusiasm in discussing class questions and raising critical opinions.

Fair

(C+, C, C-) Demonstrate moderate enthusiasm in discussing class questions and raising critical opinions.

Marginal

(D) Demonstrate marginal enthusiasm in discussing class questions and raising critical opinions.

Failure

(F) Demonstrate little to no enthusiasm in discussing class questions and raising critical opinions.

Assessment Task

Class Performance (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Excellent

(A+, A, A-) Demonstrate strong ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Good

(B+, B, B-) Demonstrate good ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Fair

(C+, C, C-) Demonstrate moderate ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Marginal

(D) Demonstrate marginal ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Failure

(F) Demonstrate little to no ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Assessment Task

Group Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to explore data mining tasks for a specific business problem.

Excellent

(A+, A, A-) Demonstrate strong ability to explore data mining tasks for a specific business problem.

Good

(B+, B, B-) Demonstrate good ability to explore data mining tasks for a specific business problem.

Fair

(C+, C, C-) Demonstrate moderate ability to explore data mining tasks for a specific business problem.

Marginal

(D) Demonstrate marginal ability to explore data mining tasks for a specific business problem.

Failure

(F) Demonstrate little to no ability to explore data mining tasks for a specific business problem.

Assessment Task

Group Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Excellent

(A+, A, A-) Demonstrate strong ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Good

(B+, B, B-) Demonstrate good ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Fair

(C+, C, C-) Demonstrate moderate ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Marginal

(D) Demonstrate marginal ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Failure

(F) Demonstrate little to no ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Assessment Task

Group Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to critically analyze and reasonably explain the results.

Excellent

(A+, A, A-) Demonstrate strong ability to critically analyze and reasonably explain the results.

Good

(B+, B, B-) Demonstrate good ability to critically analyze and reasonably explain the results.

Fair

(C+, C, C-) Demonstrate moderate ability to critically analyze and reasonably explain the results.

Marginal

(D) Demonstrate marginal ability to critically analyze and reasonably explain the results.

Failure

(F) Demonstrate little to no ability to critically analyze and reasonably explain the results.

Assessment Task

Class Performance (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to show enthusiasm in discussing class questions and raising critical opinions.

Excellent

(A+, A, A-) Demonstrate strong enthusiasm in discussing class questions and raising critical opinions.

Good

(B+, B) Demonstrate good enthusiasm in discussing class questions and raising critical opinions.

Marginal

(B-, C+, C) Demonstrate marginal enthusiasm in discussing class questions and raising critical opinions.

Failure

(F) Demonstrate little to no enthusiasm in discussing class questions and raising critical opinions.

Assessment Task

Class Performance (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Excellent

(A+, A, A-) Demonstrate strong ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Good

(B+, B) Demonstrate good ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Marginal

(B-, C+, C) Demonstrate marginal ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Failure

(F) Demonstrate little to no ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.

Assessment Task

Group Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to explore data mining tasks for a specific business problem.

Excellent

(A+, A, A-) Demonstrate strong ability to explore data mining tasks for a specific business problem.

Good

(B+, B) Demonstrate good ability to explore data mining tasks for a specific business problem.

Marginal

(B-, C+, C) Demonstrate marginal ability to explore data mining tasks for a specific business problem.

Failure

(F) Demonstrate little to no ability to explore data mining tasks for a specific business problem.

Assessment Task

Group Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Excellent

(A+, A, A-) Demonstrate strong ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Good

(B+, B) Demonstrate good ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Marginal

(B-, C+, C) Demonstrate marginal ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Failure

(F) Demonstrate little to no ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).

Assessment Task

Group Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to critically analyze and reasonably explain the results.

Excellent

(A+, A, A-) Demonstrate strong ability to critically analyze and reasonably explain the results.

Good

(B+, B) Demonstrate good ability to critically analyze and reasonably explain the results.

Marginal

(B-, C+, C) Demonstrate marginal ability to critically analyze and reasonably explain the results.

Failure

(F) Demonstrate little to no ability to critically analyze and reasonably explain the results.

Part III Other Information

Keyword Syllabus

Introduction and Overview

- Data, information, knowledge, and decision
- Business intelligence
- Data mining task

- Data collection and preprocessing
- Data mining tools (Python & SAS)

Decision Trees

- Information entropy, information gain
- Pruning criteria
- Complete tree
- Implementation with LLM

Regression Analysis

- Linear regression, logistic regression
- Least-squares estimation
- Maximum likelihood estimation
- Statistical hypothesis testing
- Implementation with LLM

Model Evaluation

- Accuracy, misclassification
- ROC
- Cumulative gains
- Lift chart
- Implementation with LLM

Unsupervised Learning

- Clustering
- Similarity
- K-means clustering
- Hierarchical clustering
- Association analysis

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	Ahlemeyer-Stubbe, A., & Coleman, S. (2014). A practical guide to data mining for business and industry. John Wiley & Sons.
2	Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. MIS quarterly, 1165-1188.
3	Moss, L. T., & Atre, S. (2003). Business intelligence roadmap: the complete project lifecycle for decision-support applications. Addison-Wesley Professional.
4	Sherman, R. (2014). Business intelligence guidebook: From data integration to analytics. Newnes.
5	Howson, C. (2007). Successful business intelligence. Tata McGraw-Hill Education.
6	Efraim, T., Sharda, R., & Delen, D. (2014). Business intelligence and analytics: Systems for decision support.
7	Biere, M. (2003). Business intelligence for the enterprise. Prentice Hall Professional.
8	吴军 (2016) 中信出版集团 “智能时代” ISBN: 9787508663814
9	Ian Witten (2011) 机械工业出版社 “数据挖掘” ISBN 9787111182054